

Effects of *Phyllostachys edulis* expansion into adjacent forest on soil nutrient concentrations in subtropical China

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Moso bamboo (*Phyllostachys edulis*) is a typical native invasive species for the neighboring tree in Asia. However, the expansion of moso bamboo into the adjacent native forests has potential to induce alterations of soil chemical characteristics due to the high growth rate of this plant. We select three contrasting forest types, including *Cryptomeria fortunei* pure forest (CF), *Cryptomeria fortunei* forest invaded by moso bamboo (PH-CF) and Moso bamboo pure forest (PH), to evaluate the effects of moso bamboo expansion on the temporal changes of soil carbon (C), nitrogen (N) and phosphorus (P) in the Lushan Mountain, subtropical China.

Results showed that: Forest types significantly affected the soil C, N and P pools in our study. The soil C content in PH-CF forest was 55.56 g kg⁻¹, which was significantly higher than that in PH and CF pure forests by 23.6% and 53.4%, respectively; the soil N concentration in PH-CF was 2.42 g kg⁻¹, which was also significantly higher than that in PH and CF pure forests by 34.4% and 149.5%, respectively, suggesting that the expansion of Moso bamboo into CF forest would enhance the soil C and N storage due to the higher growth rate of moso bamboo. On the contrary, the soil P content in PH-CF was 0.21 g kg⁻¹, which was lower than other two forests, indicating that the fast expansion of moso bamboo significantly reduces the soil total P contents.

In conclusion, our results show that the expansion of moso bamboo into adjacent forest may greatly threaten the growth of *Cryptomeria fortunei* by reducing the soil P concentration. Therefore, further studies are very necessary to investigate the underlying mechanism of soil nutrient alterations within moso bamboo expansion for the healthy and sustainable development of neighboring native forests in the Lushan Mountain, subtropical China.